



UNITED STATES PATENT AND TRADEMARK OFFICE

142

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,900	11/24/2003	Jui-Ping Li	201056-9012	5304

1131 7590 10/03/2006

MICHAEL BEST & FRIEDRICH LLP
Two Prudential Plaza
180 North Stetson Avenue, Suite 2000
CHICAGO, IL 60601

EXAMINER

DINH, THU HUONG T

ART UNIT PAPER NUMBER

2812

DATE MAILED: 10/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/720,900	Applicant(s) LI ET AL.	
	Examiner Thu-Huong Dinh	Art Unit 2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18 and 19 is/are rejected.
- 7) ☒ Claim(s) 20-23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09546936.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

WALTER LINDSAY JR.
PRIMARY EXAMINER

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>11/24/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claim 18 is rejected under 35 U.S.C. 102(b) as being anticipated by Prior Art, Samata et al. (U.S. 5,246,500 dated September 21, 1993).

Samata et al. disclose an apparatus, in Figure 3, for forming a film on a wafer in said inner part in a semiconductor process comprising: a) feeding said gas into a space (area 7) between said outer part (11) and said inner part (12) and directing the flow of said gas in the direction toward a vertical wall of said outer part (column 6, lines 9-15) to prevent particles adhered to said inner part from peeling off (column 6, lines 15-17); and b) leading said gas into said inner part along a path between said outer part and said inner part so that said gas warms before reaching said inner part. The gas contacts the outer tube, which is adjacent to the heater (10) thereby heating the gas homogeneously before reaching said inner part.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prior Art, Samata et al. (U.S. 5,246,500 dated September 21, 1993). as applied to claim 18 above, and further in view of Prior Art, Shimahara et al. (U.S. 6139642 filed May 28, 1998).

6. Prior Art, Samata et al. show the structure substantially as claimed as described in the preceding paragraphs. However, Prior Art, Samata et al. lack anticipation only in not explicitly teaching that...wherein said semiconductor process is one of a chemical vapor deposition process and a physical vapor deposition process.

7. Prior Art, Shimahara et al. teaches Substrate Processing Apparatus and Method. This invention utilizing a chemical reaction in the inside of a reaction enclosure of double structure for forming predetermined thin films on a plurality of wafers at a time.

8. Prior Art, Shimahara et al. teaches in Figure 1, a vertical chemical vapor deposition apparatus employing a reaction furnace of double structure as the reaction furnace and is a low pressure CVD apparatus (column 10, lines 60-62 and lines 66-67) (Claim 19).

9. It would be obvious to one of ordinary skill in the art, at the time of invention was made, to modify the structure shown in Prior Art, Samata et al. with Prior Art, Shimahara et al. teaching of employing a low pressure CVD apparatus in which an outside air and a gas-phase backward flow are restrained from entering the inside of a reaction chamber during thin film deposited, is carried out thus eliminate the contamination particles inside the reaction chamber.

Allowable Subject Matter

10. Claims 20-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: the prior art, either singly or in combination fails to anticipate or render obvious, the limitation of :

...wherein said film is a silicon nitride film and said particles are Si_xN_4 compounds (Claim 20 as it depends on Claim 19).

...wherein said process includes steps of (c) controlling the temperature in said inner part of said film-forming apparatus in the range of 600- 800 degree C; and (d) controlling the pressure in said inner part of said film-forming apparatus in the range of 0.1 torr to 1 torr (Claim 21 as it depends on Claim 20).

...wherein said gas is a purge gas selected from a group consisting of nitrogen, argon, and other inert gases (Claim 22 as it depends on Claim 20).

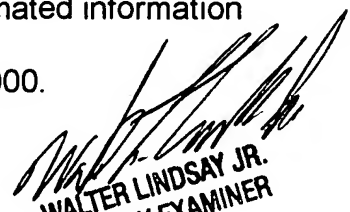
...wherein after said film is formed, said process further includes a step of (e) controlling the flow rate of said gas in the range of 300 sccm to 2000 sccm for 5 min to 15 min to devacuum said film-forming apparatus (Claim 23 as it depends on Claim 22).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thu-Huong Dinh whose telephone number is 571 272-9014. The examiner can normally be reached on Monday through Friday (8:30AM-5:00PM Eastern).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on 571 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


WALTER LINDSAY JR.
PRIMARY EXAMINER